

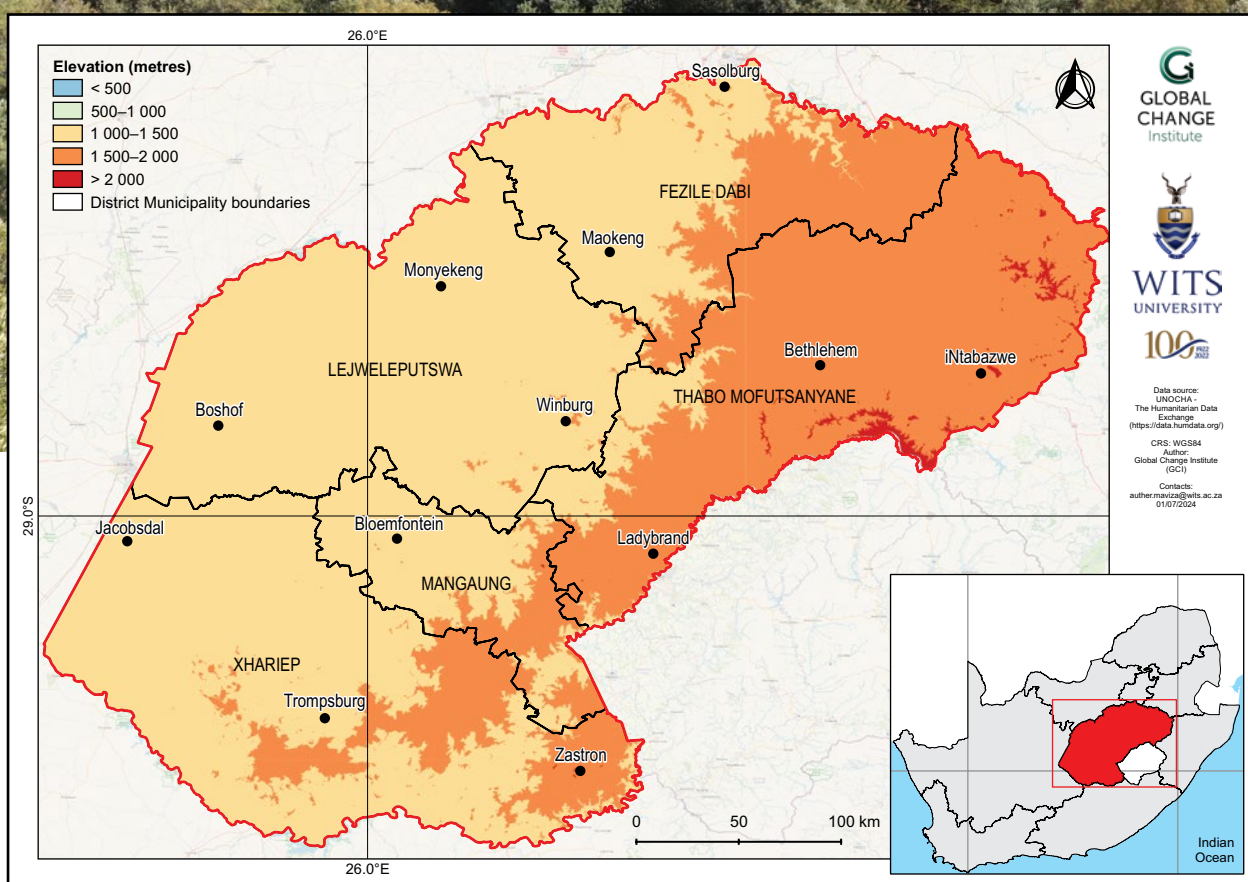
Free State climate change fact sheet

South Africa

PROVINCIAL

Introduction

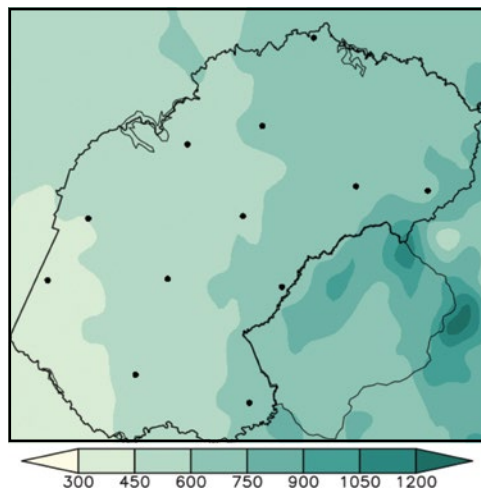
- This fact sheet is part of a series of provincial fact sheets developed by the Wits GCI and SANBI. The fact sheets present a summary of observed and projected changes in climate over the provinces of South Africa. They should be used together with the guidelines presented in the cover page.
- The Free State covers an area of approximately 129 825 km², with elevation ranging from 1 200 m above sea level on the central and western plateau, to 2 100 m above sea level at the foothills of the Drakensberg in the east, along the border of Lesotho.
- The province is semi-arid in the west, but with a west-east gradient in rainfall, and the eastern parts of the province being substantially wetter. Strong dry-wet seasonality characterises the province's climate, with the bulk of rainfall occurring in summer. The winters are very dry, with clear skies and occasional frost.



Observed climate: rainfall (1981–2000)

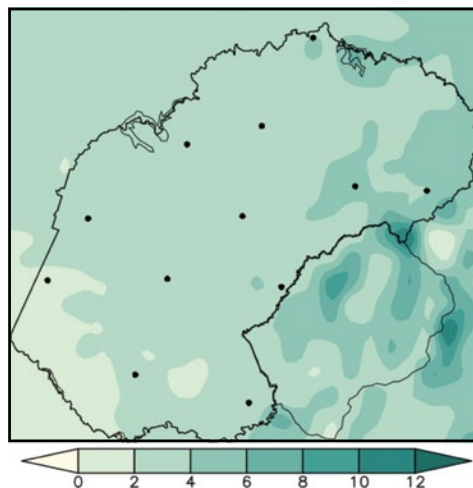
Mean annual rainfall

Mean annual rainfall ranges from less than 450 mm in the west to 750 mm in the east.



Extreme rainfall days

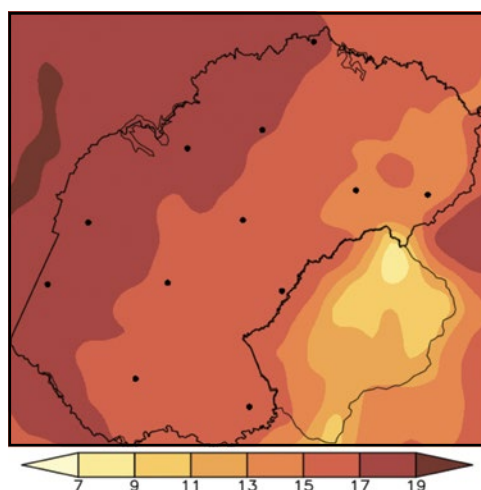
Observed mean annual number of extreme rainfall days ranges from less than 2 days over the semi-arid regions in the west to more than 6 days over the highlands in the east.



Observed climate: temperature (1981–2000)

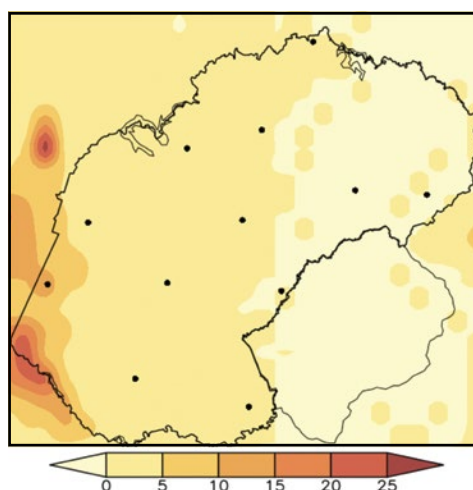
Mean annual temperature

Mean annual temperature ranges from as low as 11 °C over the eastern highlands to more than 19 °C over the semi-arid regions in the west.



Very hot days

The mean annual number of very hot days ranges from 0 days over eastern highlands to more than 20 days over the semi-arid regions in the west.

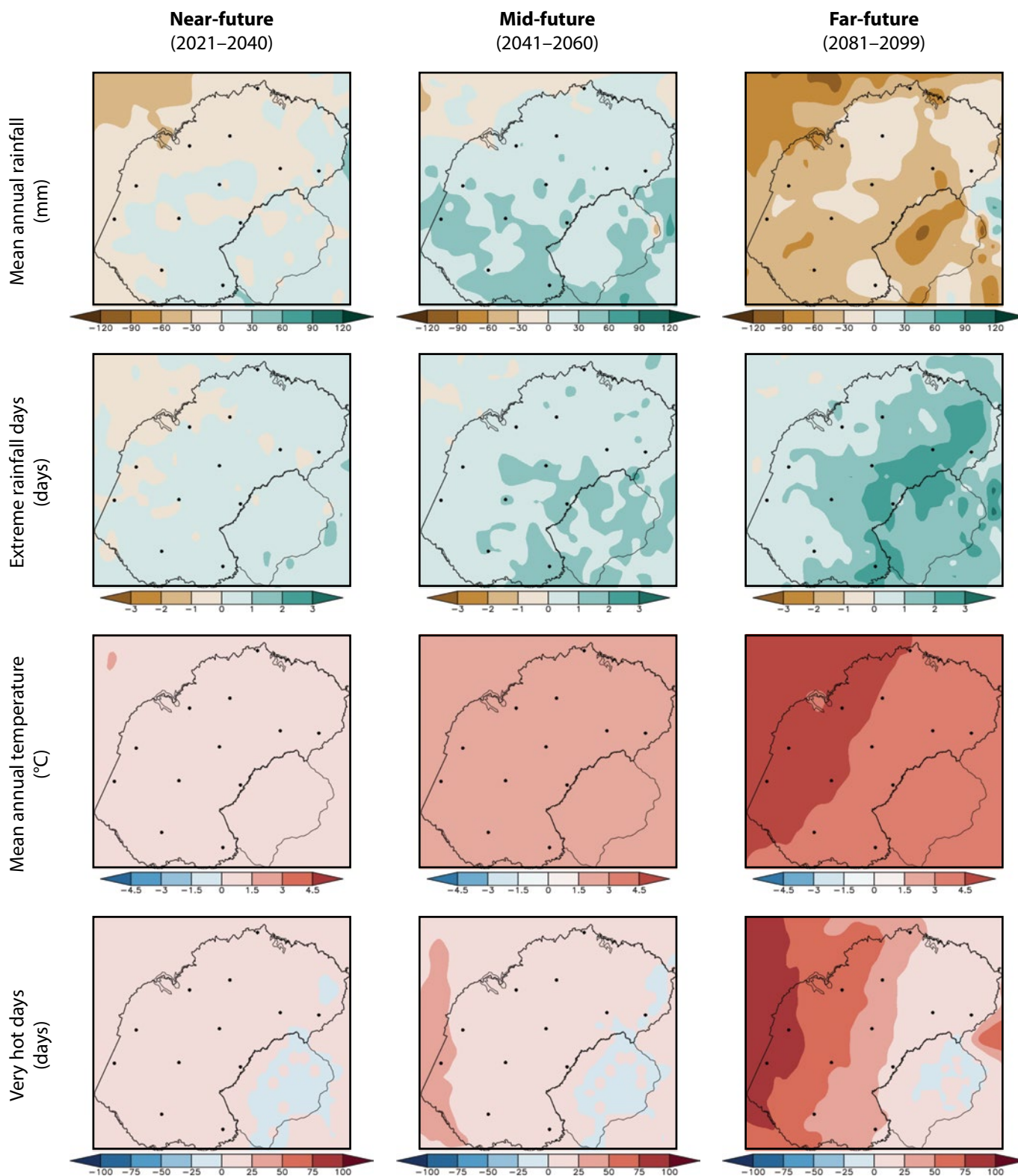


Observed climate trends (overview)

- Observed decrease in mean annual rainfall (*low confidence*).
- Observed increase in the frequency of extreme rainfall events (*high confidence*).
- Observed increase in mean annual temperature and warm extremes (*virtually certain*); decrease in cold extremes (*high confidence*).
- Observed increases in meteorological and agricultural drought (*low confidence*).

Projected future climate change (overview)

- Projected changes in mean annual rainfall are uncertain in the near- and mid-future, but with projected decreases in the far-future (*high confidence*).
- Projected increase in the frequency of extreme rainfall events (*high confidence*).
- Projected increase in mean annual temperature and warm extremes (*virtually certain*); decreases in cold extremes (*high confidence*).
- Projected increase in agricultural and meteorological drought in the far-future (*high confidence*).



Projected future climate change (*detailed*)

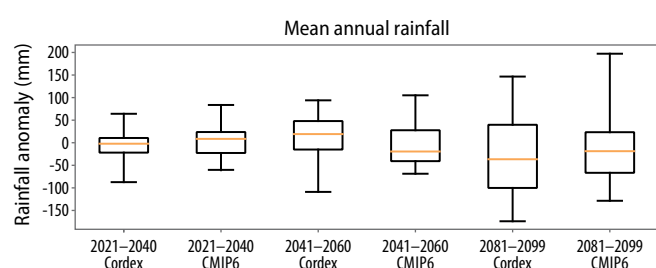
Near- and mid-future

- Projected changes in rainfall in the near- and mid-future are *uncertain*.
- Projected increase in extreme rainfall events (*likely*).
- Projected increase in temperature and warm extremes (*virtually certain*); decrease in cold extremes (*very likely*).
- Projected increase in agricultural and meteorological drought (*more likely than not*).

Far-future

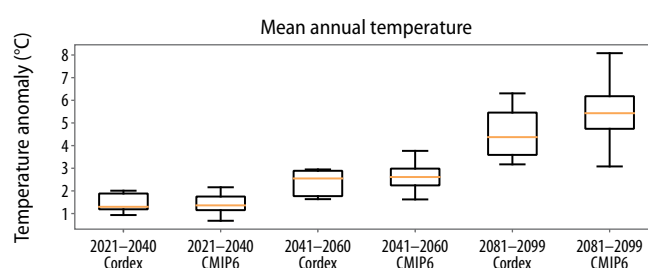
- Projected decrease in rainfall (*likely*).
- Projected increase in extreme rainfall events (*likely*).
- Projected increase in temperature and warm extremes (*virtually certain*); decreases in cold extremes (*very likely*).
- Projected increase in agricultural and meteorological drought (*very likely*).

Climate model projections: model agreement and uncertainties



Mean annual rainfall

- Averaged across the province, rainfall projections in the near- and mid-future are *uncertain*.
- General rainfall decreases are *likely* in the province in the far-future under low mitigation scenarios.
- Partially in response to *virtually certain* temperature increases, agricultural drought is to occur more frequently in the near- and mid-future (*low confidence*) and far-future (*very likely*).



Mean annual temperature

- Temperature increases averaged across the province are *virtually certain* in the near-future and may be as high as 2.0 °C.
- Under low mitigation, further temperature increases are *virtually certain* and may approach 3.0 °C in the mid-future and 6.0 °C in the far-future.
- Increases in average temperature will be accompanied by increases in warm temperature extremes such as heatwaves and high fire danger days (*likely*).

Citation:

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